CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8) Applicant(s): C. PANZERA ET AL.			Docket No. JEN-0005-Z
Application No. 09/460,951	Filing Date 12/14/1999	Examiner J. M. Hoffman	Group Art Unit 1731

Invention: METHOD OF MANUFACTURE OF DENTAL PORCELAIN HAVING SMALL LEUCITE CRYSTALLITES

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TRANSMITTAL OF APPEAL BRIEF (Small Entity)	Docket No. JEN-0005-Z

In Re Application Of: **C. PANZERA ET AL.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/460,951	12/14/1999	Derrington, J.	23413	1731	3152

Invention: **METHOD FOR MANUFACTURE OF DENTAL PORCELAIN HAVING SMALL LECITE CRYSTALITES**

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on: December 20, 2004

☒ Applicant claims small entity status. See 37 CFR 1.27

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	CARLINO PANZERA ET AL	Group Art Unit: 1731
SERIAL NUMBER:	09/460,951	Before the Examiner: Derrington, J.
FILED:	December 14, 1999	
FOR:	METHOD OF MANUFACTURE OF DENTAL PORCELAIN HAVING SMALL LEUCITE CRYSTALLITES	

APPEAL BRIEF

Commissioner for Patents
P.O. BOX 1450
Alexandria, VA 22313-1450

REAL PARTY IN INTEREST

The real party in interest is Jeneric/Pentron, Inc., North Plains Industrial Road, Walligford, CT 06492.

RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any related appeals or interferences.

STATUS OF CLAIMS

Claims 1-7 remain pending in the present application. Claims 1-7 were finally rejected in a Final Office Action issued on July 19, 2004 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,698,019 to Frank or German Patent 1441336 in view of Chemical Abstracts 120 (M.Y. Shareef et al). A clean copy of claims 1-7 are attached hereto as Appendix 1.

Appellants appeal from the final rejection of claims 1-7.

STATUS OF AMENDMENTS

No amendments have been filed subsequent to final rejection.

SUMMARY OF INVENTION

The following is a concise explanation of the invention defined in the claims. This summary does not limit the claims.

The pending claims are directed to a dental porcelain composition for dental porcelain restorations, as well as inlays, onlays and veneers. [Application, p. 1, ll. 7-8]. The porcelain composition comprises two phases, a leucite crystallite phase and a feldspathic glass matrix phase. [Application, p. 4, ll. 7-9]. The leucite crystallites are present in an amount ranging from about 5 to about 65 weight percent based on the weight of the entire composition. The

leucite crystallites present in the composition possess diameters not exceeding about 10 microns, preferably not exceeding about 5 microns, more preferably not exceeding about 1 micron. [Application, p. 6, ll. 11-15].

The porcelain composition has a maturing temperature of from about 650° C to about 1050° C and a coefficient of thermal expansion (room temperature to 450° C) of from about 12 x 10-6/°C to about 17.5 x 10-6/°C. [Application, p. 4, ll, 10-12]. The porcelain composition comprises the following:

Component	Amount (wt.%)
SiO2	57-66
Al2O3	7-15
K2O	7-15
Na2O	7-12
Li2O	0.5-3
CaO	0-3
MgO	0-7
F	0-4
CeO2	0-1

It is essential to the practice of the present invention that the leucite crystallites not exceed about 10 microns in diameter. [Application, p. 4, ll. 26-27]. Diameters in excess of about 10 microns will impart an undesirably rough and uneven surface to the composition when employed in its intended environment of use. [Application, p. 5, ll. 1-2]. Indeed, it has been determined that leucite diameters above about 10 microns may wear away local dentition and cause discomfort/irritation inside the oral cavity. [Application, p. 5, ll. 3-4].

In one embodiment of the present invention, the two-phase dental porcelain composition is derived from a blend of a first porcelain component possessing a low fusing

temperature and a moderately high coefficient of thermal expansion, with a second porcelain component possessing a high coefficient of thermal expansion and containing a dispersed crystalline leucite phase wherein the leucite crystallites are less than about 10 microns in diameter. [Application, p. 6, ll. 16-22].

The small crystal size can be achieved by mixing the second porcelain component in powder form, such as powder sufficiently fine to pass through a 200 mesh screen (Tyler series), with water in a suitable vessel, allowing the mixture to settle, decanting and retaining the supernatant liquid, mixing the retained supernatant liquid with water in a suitable vessel, allowing the mixture to settle a second time, decanting and retaining the supernatant liquid, evaporating the water of the retained supernatant liquid to provide dried powder and screening the dried powder through 325 (or greater) mesh screen (Tyler series) to break up any agglomerates. [Application, p. 9, ll. 5-19]. By virtue of the foregoing treatment, leucite crystallites possessing diameters not exceeding about 10 microns will be separated and isolated from the second porcelain component. [Id].

ISSUES

Whether claims 1-7 are patentable under 35 U.S.C. § 103(a) over Frank or German Patent 1441336 in view of Shareef et al.

GROUPING OF CLAIMS

Not applicable.

ARGUMENT

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) over Frank or German Patent 1441336 in view of Shareef et al. Appellants request reversal of this rejection.

Frank and Germany 1441336 teach dental restoration materials comprising a leucite crystalline phase for use in preparing crowns, bridges and the like. However, Frank and Germany 1441336 do not teach the use of leucite crystals not exceeding about 10 microns in diameter. Germany 1441336 says nothing of crystal size and Frank teaches leucite crystals having an average size of less than 3 microns. Of course, an average crystal size of less than 3 microns indicates that crystals of greater than about 10 microns may be present in the composition. Shareef et al does not teach the use of crytal sizes not exceeding about 10 microns. Rather, Shareef teaches that leucite crystals having a more uniform distribution and finer size may provide higher flexural strength and less microcracking. The Examiner concluded that the teaching of Shareef provided an "incentive to use the instant crystallite particle size with the process of Frank et al (or Germany 1441336) in order to achieve the benefits disclosed by Shareef et al. [See Office Action, 1/13/03]. Respectfully, the Examiner's rejection is improper and should be reversed.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

In making the rejections over Frank in view of Shareef et al, the Examiner stated that Frank discloses a material with components which overlap the claimed components. [See Office Action, 1-13-03, p. 2). Second, the Examiner states that, due to this overlap, the claimed maturing temperatures and coefficients of thermal expansion would be inherent in the materials of Frank. [Id]. Third, the Examiner states that Applicant's claims regarding leucite crystals "not exceeding 10 microns" is rendered obvious by Frank in view of Shareef

et al because Frank discloses an average crystal size of 3 microns and, in addition, teaches "that it is advantageous for mechanical strength if 'all the crystals of the individual phases are essentially of the same size.'" [Id]. Further, the Examiner states that Shareef et al teaches that leucite crystals having a more uniform distribution and a finer size provide higher flexural strength and less microcracking, thus providing incentive to use the particle size disclosed in the process of Frank in order to achieve the benefits disclosed in Shareef et al. [Id., p.3]. Similarly, the Examiner stated that Germany 1441336 discloses Applicant's claimed dental porcelain "with the exception of the claimed limitation 'diameters not exceeding about 10 microns.'" [Id]. The Examiner further stated that Shareef et al teaches that "leucite crystals having a more uniform distribution and finer size" are desirable. [Id].

The Examiner's obviousness rejections should be reversed because none of the references relied on render obvious all elements of Applicant's claims. *See In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970) (Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art). None of the cited references, either alone or in combination, disclose or suggest leucite crystals not exceeding about 10 microns to one of skill in the art. By definition, the average crytal size disclosed in Frank allows for crystal sizes without an upper limit and, therefore, may include crystals of greater than about 10 microns in diameter. In the Final Office Action, the Examiner stated that it "does not appear to be true" that Frank does not disclose an absolute crystal size of less than 10 microns. [Final Office Action, p. 2]. However, the Examiner did not provide a basis for this conclusion. Contrary to the Examiner's remark, Frank explicitly states that the crystal size is an "average." [See Frank, col. 2, ll. 62-67; claims 5,7].

Further, Frank's statement that the crystals "are essentially of the same size" does not preclude the presence of some crystals over 10 microns. To the contrary, the statement inherently allows for the presence of some crystals outside of the desired size range. This is a critical difference between Frank and the present Application because the present Application does not permit any crystals over 10 microns.

Moreover, the cited references cannot render obvious Applicant's claims to an absolute crystal size of less than 10 microns because they provide no teaching to one of skill in the art how to obtain an absolute crystal size of less than 10 microns. In contrast, the present Application provides detailed teaching on how to obtain an absolute crystal size of less than 10 microns. For example, the Application teaches the following:

> In accordance with the practice of the present invention, the second porcelain component, prior to being combined or blended with the first porcelain component, is treated to separate and isolate leucite crystallites possessing diameters not exceeding about 10 microns. Leucite crystallized possessing diameters not exceeding about 10 microns will impart extremely smooth surfaces to dental restorations produced with the porcelain composition of this invention. The second porcelain component can be treated by mixing the second porcelain component in powder form, such as powder sufficiently fine to pass through a 200 mesh screen (Tyler series), with water in a suitable vessel, allowing the mixture to settle, decanting and retaining the supernatant liquid, mixing the retained supernatant liquid with water in a suitable vessel, allowing the mixture to settle a second time, decanting and retaining the supernatant liquid, evaporating the water of the retained supernatant liquid to provide dried powder and screening the dried powder through 325 (or greater) mesh screen (Tyler series) to break up any agglomerates. By virtue of the foregoing treatment, leucite crystallites possessing diameters not exceeding about 10 microns will be separated and isolated from the second porcelain component.

[Application, p. 9, ll. 5-22].

"In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." *Beckman Instruments, Inc.*

v. LKB Produkter AB, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed.Cir.1989) (emphasis added). Thus, because the cited references are non-enabling as to an absolute crystal size of less than 10 microns, the Applicant's claims are not rendered obvious.

The Examiner disregarded Applicant's argument regarding enablement on the grounds that it would render Frank invalid. [See Final Office Action, p. 2]. Respectfully, the Examiner misinterprested Applicant's argument regarding enablement because Applicant did not argue that the specification of Frank does not enable Frank's claims. Rather, Applicant argued that Frank does not enable Applicant's claims. Clearly, the difference is critical because Frank would not be rendered invalid for failing to enable Applicant's claims.

As discussed above, neither Frank, Germany 1441336, nor Shariff et al provides any teaching as to how to eliminate all crystals larger than about 10 microns. In other words, a person of skill in the art practicing any of the cited references would make a glass-ceramic having an average crytal size of less than 5 or 3 microns, but also containing some crystals larger than about 10 microns. Thus, the Applicant's pending claims are not rendered obvious.

In addition, the Examiner has stated that the remarks at the bottom of page 9 of the Application, regarding knowledge of one of skill in the art, render Applicant's arguments regarding enablement unpersuasive. [Final Office Action, p.3]. Specifically, the Examiner stated that "applicant states that one of ordinary skill knows how to isolate the small diameter particles." Respectfully, the Examiner has misinterpreted the remarks at page 9 of the Application. At page 9, lines 5-17, the application provides a detailed description of the preferred method for separating crystals larger than about 10 microns from the porcelain. Next, at lines 16-22, Applicant makes the following statement:

> By virtue of the foregoing treatment, leucite crystallites possessing diameters not exceeding about 10 microns will be separated and isolated from the second porcelain component. It will be understood by those skilled in the art that variations of the foregoing treatment method or other treatment methods or combinations thereof such as jet milling, air classification, floatation, etc. can be employed herein to separate and isolate the small diameter leucite crystallites.

[Application, p. 9, ll. 16-22].

When read in proper context, it is clear that the above statement is meant to convey that, in light of the detailed disclosure of the preferred method immediately preceeding it, persons of skill in the art will now understand certain variations of the method and other methods that may be used to separate out all crystals larger than 10 microns. Previously, no such methods were disclosed in the prior art.

Thus, it has been shown that neither Frank nor Germany 1441336 in view of Shareef et al, disclose or teach leucite crystals less than 10 micron diameter, an element of independent claim 1, and therefore cannot render claim 1 obvious. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, dependent Claims 2-7 are nonobvious as well.

CONCLUSION

In view of the foregoing, Appellant requests that the rejection of claims 1-7 under 35 U.S.C. § 103(a) be reversed.

If there are any additional charges with respect to this Appeal Brief or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Appellant's Attorneys.

Respectfully submitted,

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APPENDIX 1 – CLAIMS ON APPEAL

CLAIM 1. A method of fabricating a dental restoration comprising:

providing a framework possessing a coefficient of thermal expansion of as high as about 18 x 10-6/°C; and

fusing a dental porcelain composition comprising a leucite crystallite phase dispersed in a feldspathic glass matrix to said framework to provide a smooth, non-abrasive surface thereon;

said fused dental porcelain composition having a maturing temperature in the range from about 750° to about 1050° C., a coefficient of thermal expansion (room temperature to 450° C.) of from about 12 x 10-6/°C. to about 17.5 x 10-6/°C., and comprising:

Component	Amount (wt. %)
SiO_2	57-66
Al_2O_3	7-15
K_2O	7-15
Na_2O	7-12
Li_2O	0.5-3

and further comprising a dispersed leucite crystallite phase representing from about 5 to about 65 weight percent of the dental porcelain, and wherein the leucite crystallites possess diameters not exceeding about 10 microns.

CLAIM 2. The method of Claim 1 wherein the leucite crystallites of the fused porcelain have diameters not exceeding about 5 microns.

CLAIM 3. The method of Claim 2 wherein the leucite crystallite are less than have diameters not exceeding about 1 micron.

CLAIM 4. The method of Claim 1, wherein the dental porcelain has a maturing temperature of from about 800° to about 1000°C.

CLAIM 5. The method of Claim 1, wherein the dental porcelain is fired at a temperature ranging from about 780° to about 870°C.

CLAIM 6. The method of claim 1, wherein the fused porcelain is a two-phase porcelain.

CLAIM 7. The method of Claim 1 wherein the fused dental porcelain composition further comprises at least one of:

Component	Amount (wt. %)
CaO	0-3
MgO	0-7
F	0-4
CeO_2	0-1